REMARKS

Claims 1-29 are pending in the present application. Applicant appreciates the indication that claims 1-20 are allowed. In the Final Office Action mailed May 3, 2004, the Examiner rejected claims 21-29 under 35 U.S.C. §101 as being directed to non-statutory subject matter. Applicant respectfully disagrees.

The Examiner rejected claims 21-29 under 35 U.S.C §101 stating that:

> [T]he claimed invention is directed to non-statutory subject matter. A **pulse sequence is considered to be a type of signal** which does not encompass any of the statutory categories of invention. Applicant's attention is invited to MPEP 2106 which states "Claims that recite nothing but the physical characteristics of a form of energy such as frequency, voltage, or the strength of a magnetic field, define energy or magnetism, per se, and as such are nonstatutory natural phenomena. O'Reilly v. Morse, 56 U.S. (15 How.) 62 112-14 (1853)." Emphasis added.
>
> The Examiner is directed to MPEP §2106.IV.B.1(c) which states:
>
> [A] signal claim directed to a practical application of electromagnetic energy is statutory regardless of its transitory nature. See O'Reilly, 56 U.S. at 114-19; In re Breslow, 616 F.2d 516, 519-21, 205 USPQ 221, 225-26 (CCPA 1980).

Therefore, by the Examiner's own admission that the "pulse sequence is considered to be a type of signal" requires withdrawal of the §101 rejection.

> The Examiner argues that:
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> The claims are not directed to a practical application. The claims fail to positively set forth any means for producing the pulses or means for acquiring MR data after the pulses have been applied to a patient's body. Therefore, the claims merely set forth a series of pulses of electromagnetic radiation with the intended use that they be directed to a slab of slices in the patient's body. Office Action, 5/3/2004, p. 2.

A "pulse sequence" as claimed is not a characterization of naturally occurring phenomena or a restatement of physical characteristics of a form of energy. The claimed pulse sequence is directed to a specific and novel application of electromagnetic energy and

this application has specific practicality in "multi-slice MR data acquisition" – as called for in claim 21.

Applicant acknowledges that laws of nature, natural phenomenon, and abstract ideas are not patentable; however, such a pulse sequence does not occur "naturally", is not an "abstract idea", and is certainly not a "law of nature". It is a signal, as the Examiner admits, and it is indeed directed to a very practical application – multi-slice MR data acquisition.

Of course, a process, machine, manufacture, or composition of matter employing a law of nature, natural phenomenon, or abstract may be patentable..." See e.g. *Parker v. Flook*, 437 U.S. 584, 590 (1978). (Emphasis Added) The U.S. Supreme Court pronounced in *Funk Bros. Seed Co. v. Kalo Inoculant Co.*, 333 U.S. 127 (1948), that, an application of a "hitherto unknown phenomenon of nature" to a new and useful end is patentable – the useful end here is MR data acquisition.

Applying this standard to claims 21-29, it is clear that the subject matter of claims 21-29 is patentable. Although magnetism and RF emissions are naturally occurring phenomenon, in MR imaging, these properties are manipulated and exploited to acquire MR data. It is the generation and manipulation of magnetic fields and the precession of nuclei with a pulse sequence that characterizes the use of these phenomena to a new and useful end. In this regard, a "pulse sequence" defines the manner in which these naturally occurring phenomena are to be exploited to reach a new and useful end, namely, "multi-slice MR data acquisition."

Claims 21-29 are directed to a specific, practical application of electromagnetic energy. Since claims 21-29 are directed to a sequence of specific and uniquely tailored pulses that have utility in MR data acquisition, they satisfy §101 and are patentable under the guidance of the MPEP and case law. Additionally, the Examiner's attention is directed to related issued USP 6,498,946 having similarly structured claims - - see claims 21-29. Accordingly, Applicant requests withdrawal of the rejection to claims 21-29.

Applicant appreciates the Examiner's consideration of these Remarks and cordially invites the Examiner to call the undersigned, should the Examiner consider any matters unresolved.

Respectfully submitted,

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